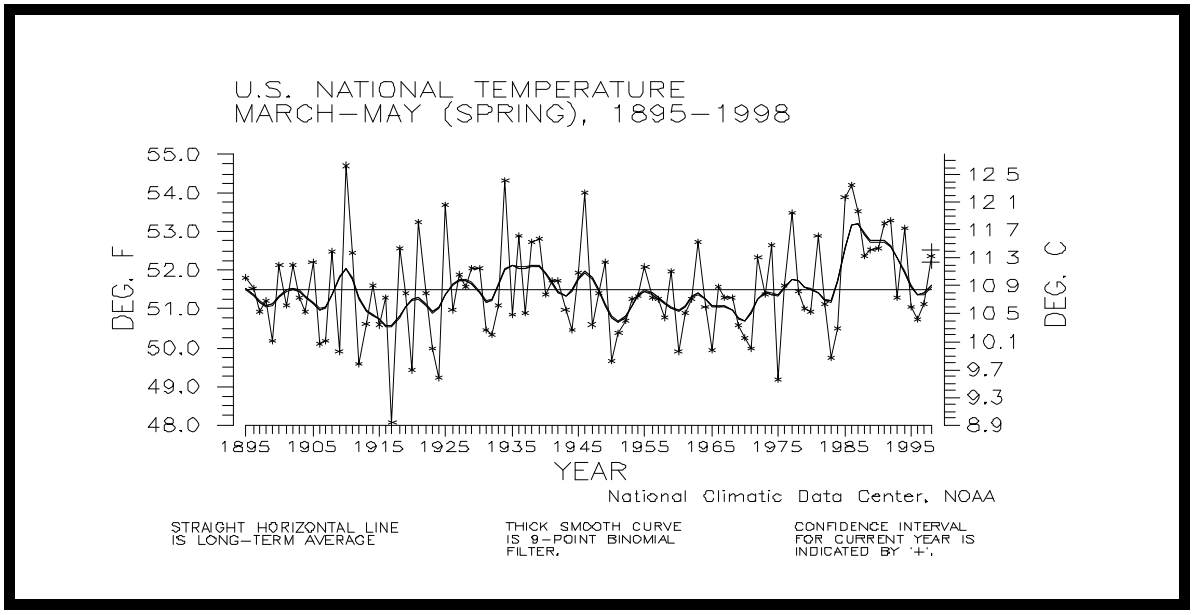
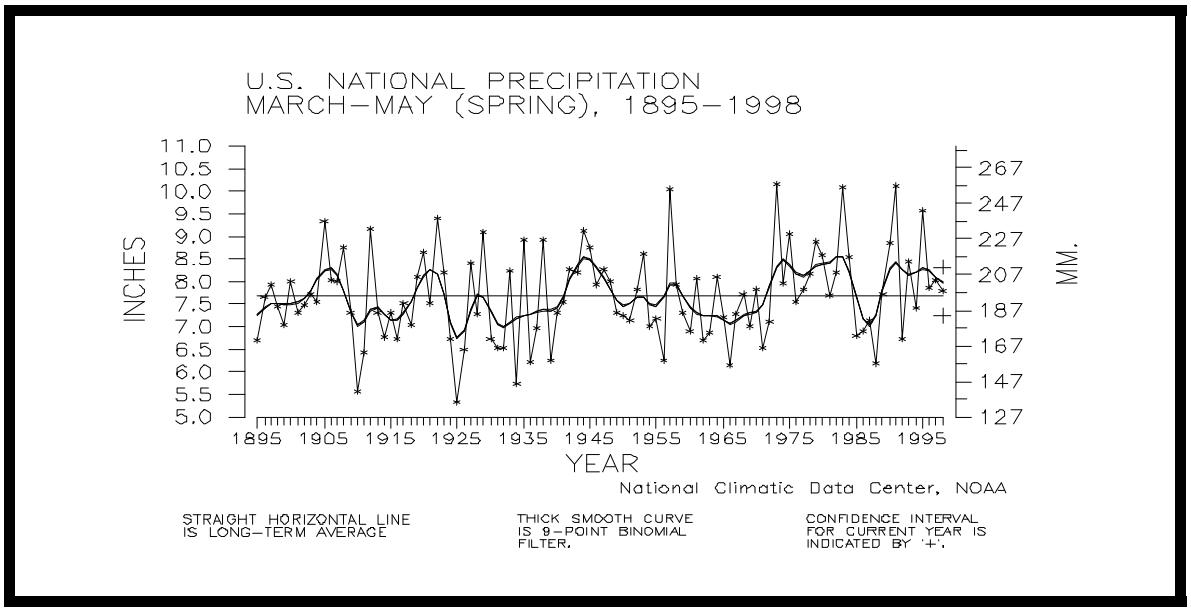
# Monthly Activity Report

May 1998


**Preliminary temperature data indicate that the spring season, March-May, for the contiguous U.S. was the 24th warmest such season since 1895 (top figure). Eighteen percent of the country was much warmer than normal, while about three percent of the country was much cooler than normal.**

**Preliminary data indicate that spring 1998 was the 47th wettest such period on record for the contiguous U.S. (bottom figure). Nearly 15 percent of the country was much wetter than normal, while about nine percent of the country was much drier than normal.**

# DIRECTOR'S HIGHLIGHTS

### April Warmth

Preliminary data collected by the National Climatic Data Center and provided to the White House show that April 1998 and January - April 1998 mean temperatures for the surface of the globe were at record levels. The results are particularly significant in that both land stations and ocean surface temperatures show the same record heat. This continues a warming trend that has persisted off and on for most of this century, and has been particularly pronounced during the recent record El Niño. The U.S. had about normal mean temperature for April, but precipitation was at near record levels.

### NASA/NOAA Prototype Long-Term Archive System

The National Aeronautics and Space Administration (NASA)/National Oceanic and Atmospheric Administration (NOAA) Prototype Long-Term Archive System underwent acceptance testing on May 21, and became operational on May 26. NASA Upper Atmosphere Research Satellite (UARS) and Total Ozone Mapping Satellite (TOMS) data are available. The data are ordered through NOAA's on-line system at the National Climatic Data Center and are serviced by a NOAA site collocated with NASA in building 32 of the Goddard Space Flight Center's Distributed Active Archive Center (DAAC). Data are ingested regularly from the NASA DAAC. The data are available on-line through at http:\www.ncdc.noaa.gov, Satellite Resources, Get/View data. Data can be ordered on-line and delivered either on-line or off-line. The experience gained with this six-month prototype will be used to help estimate the costs associated with the long-term archive of NASA's Earth Observing System's data.

### Phase III of NNDC On-Line Data Store Now Available

Phase III of the NOAA National Data Centers (NNDC) On-Line Data Store was made available to NNDC Web site customers on May 21, 1998. The Phase III software added new data sets and improved functionality to the on-line system, to include 12 months of cooperative station data, a new ESRI ArcView Geographic Information System global map tool, and capability of downloading Form 10A/B surface observations, unedited Local Climatological Data summaries, and cooperative station data in ASCII format. A major functionality feature of the Phase III software is on-line charging for on-line data access, which is billed to customers' major credit card accounts.

### May Statistics Confirm Continued Customer Transition To On-Line Access

May 1998 customer service activity statistics evidence the continuing shift from off-line delivery of data to a growing customer preference for on-line access of climate products. The growing preference for electronic mail as contact media of choice is evidenced by the 49 percent increase in requests received in May 1998 as compared to May 1997 statistics. On-line customer statistics for May 1998 demonstrated growing demand for National Climatic Data Center (NCDC) climate data delivered via the World Wide Web. On-line data sales for May 1998 represent a 23 percent increase over the previous month's total. NOAA National Data Centers (NNDC) Web site statistics indicate that 10,200 unique users accessed approximately 68,000 pages of data during the month, which represents a 31 percent increase over April 1998 totals.

### Regional Climate Center Interactions

The Regional Climate Centers' (RCC) Directors met with the National Climatic Data Center (NCDC) staff in early May. Several action items resulted from the meeting, including the development of a joint climate services plan, a system to transfer daily cooperative data from the RCCs to NCDC. In an effort to increase the coordination and cooperation within the Unified Climate Access Network (UCAN), a meeting was held with Kevin Robbins, Director, Southern Regional Climate Center; Bill Noon, Northeast Regional Climate Center; and Claudia Perot, U.S. Department of Agriculture. It was agreed there would be continued efforts to develop one system of climate databases, including metadata, to be used in customer servicing and other applications.

The High Plains Climate Center (HPCC) began the development of an upper air survey that will be distributed to several thousand users. The HPCC is trying to determine uses/requirements for high resolution upper air data as produced by the National Weather Service's new Rawinsonde Replacement System. The survey was released in late May.

### Financial Instruments

Mr. Michael Crowe, of the National Climatic Data Center (NCDC), was an invited speaker and panel member at the Weather Financial Instruments conference held in New York City, May 11-12, 1998. The meeting drew about 150 attendees, most of whom were from the energy, insurance, reinsurance, banking and financial sectors. Weather derivative instruments are being used in increasing numbers to manage risk related to losses in revenue due to weather and climate extremes. Historical and current weather and climate data are crucial in the development and settlement of these financial instruments. The Department of Commerce and NOAA were well represented at the meeting, and the interest shown by government representatives was noted and appreciated. An invitation was extended to the attendees to visit NCDC in order to promote understanding of the proper uses of data and to discuss the dissemination of weather and climate data and metadata in a manner which would be most beneficial to their endeavors.

### Energy

On April 15, Alan Basist, of the National Climatic Data Center, traveled to Washington, D.C., and gave a talk to Energy Frontiers International, a consortium of industries in fossil fuel production. The topic of the talk was the Observed Warming Trend in the Global Climate Record. Three speakers gave presentations in the morning; there was a representative from NASA, the Department of Energy, and the National Oceanic and Atmospheric Administration.

### Congressional Brief

The National Climatic Data Center's (NCDC) Dr. David Easterling has been invited by Tim Ford of Harvard to participate in a congressional briefing June 3rd on severe weather events, flooding and human health.

### NCDC Participates at NOAA-K Educator's Conference

The National Climatic Data Center (NCDC) participated at the NOAA-K Educators Conference at Vandenberg AFB, CA, May 12-13, 1998. The conference was jointly sponsored by NOAA/NASA and was held in conjunction with the NOAA-K satellite launch. The first part of the conference was marked by a successful Titan III launch which put the NOAA-K satellite in orbit at approximately 500 miles above the earth's atmosphere. The second part focused on the outreach activity to educators by NOAA and NASA. There were more than 100 teachers in attendance. Tom Ross was one of ten invited presenters, and he gave an overview entitled "NCDC's Products and Services available via the World Wide Web." Mr. Ross highlighted the various Web pages that would be of interest to teachers for environmental science. He also gave an overview of NCDC off-line products/services.

# CLIMATE DATA AND INFORMATION SERVICES

## ✦ Data Base Development

### New Archive System

The National Climatic Data Center (NCDC) has developed, tested, and implemented a 3590 archive system to replace the existing 3480 polar satellite data archive. New hardware and developed software now allow the Office of Satellite Data Processing and Distribution (OSDPD) Central Environmental Satellite Computer System computer to electronically archive directly to the Satellite Services Branch (SSB) Satellite Archive and Retrieval System (SARS) IBM 3494 robotics server via an optical fiber channel. SARS will hold up to 800, 3590 tapes and represents about 4 years (or 8 terabytes) of current polar level 1b and product data. This reduces the archive tape volume by a factor of more than 100:1. The new operation frees OSDPD from generating level 1b 3480 tapes which must be manually transported to SSB. The new archive system allows for expedient delivery of archived data when filling customer orders.

## ✦ Data and Information Distribution

### El Niño Web System Placed On-Line

The National Climatic Data Center (NCDC) has placed a new "El Niño" Web system on-line which brings together a number of existing Web pages into one coherent system. The system provides links to special reports related to El Niño (e.g., describing specific weather events), related datasets (e.g., daily/hourly surface data), satellite images, Next Generation Weather Radar (NEXRAD) hourly composites, and other NOAA El Niño related pages. It's accessible via NCDC's homepage under the "Climate Products and Publications" page. Also, a new report describing the wet weather in the southeast was placed on-line and is linked into the main El Niño web page.

### The El Niño Winter of '97-'98

The National Climatic Data Center (NCDC) completed Technical Report 98-02, The El Niño Winter of '97-'98. The 28-page report includes monthly highlights of the December 1997 - February 1998 period, tables of some of the records set during the winter, descriptions of several severe weather events (e.g., California flooding, northeast ice storm, Florida tornadoes), national maps of temperature and precipitation, and satellite images of some of the storm systems. The report is available to customers for free on the Web (html version) or they may purchase a paper copy by calling the Climate Services Division, or by ordering via the NOAA National Data Center's On-line Store.

### NNDC Server Design

The NOAA National Data Center (NNDC) server team initiated the development phase of the server design project. Each data center has received and installed an evaluation copy of Environmental Systems Research Institute ArcView and Spatial Database Engine software. Team members are designing search, data access and browse interfaces for team approval at the June meeting in Asheville. The team is also investigating metadata requirements and methods of integrating with NOAAServer.

### NOAAServer Meeting

National Climatic Data Center personnel met with

members of the NOAAServer project team to research opportunities for cooperation. Although it appears that sharing identical search and retrieval software will not be possible, the NOAA National Data Center team hopes to continue sharing tools that have been an advantage to all data centers.

### National Mosaic Images

The University Corporation for Atmospheric Research (UCAR)/Joint Office of Scientific Support (JOSS) provides national mosaic hourly images of WSR-88D reflectivity data to NCDC for web users to browse. This popular web page has up to 750 hits per day. JOSS agreed to extend the hourly-image file as far back in time as possible. NCDC currently has hourly images from April 19, 1997, to the present and once daily images from April 1, 1995. In the near future, we should receive hourly images for the period October 1995 through April 1997.

### Recording Media for NEXRAD Level III Data

The National Weather Service (NWS) plans to replace the obsolete WORM optical disk technology for recording Level III data in the Open-system Radar Products Generator (ORPG) upgrade due for completion in 1999. Rex Reed, Greg Cate, Mike Jain and Don Horvat from NWS/OSF Engineering Branch, and Bob Saffle, NWS/OSD, visited NCDC on May 19, 1998, to review the NCDC Level III archive and dissemination procedure and discuss possibilities for Level III recording in the WSR-88D open-system redesign. NCDC estimated hardware, supplies and implementation costs for receiving data for a central collection facility and provided that information to the NWS Office of Meteorology at their request. Other options being considered by NWS/OSF engineering include transfer of data via the Internet, upgrading the NWS WAN from its current 256KB bandwidth to accommodate Level III data, and recording Level III data on a JAZ/Zip disk which holds 2GB of data.

### Metropolitan Area Climate Summary Development

The development team continued to work on the details of the new climate summary. The National Climatic Data Center (NCDC) has begun the programming effort required to produce the new summary. Additional data for the month of April was received from the Regional Climate Centers. These data will be used an example of what can be included in the summary in near-real time. The data included several cooperative sites, but also included were many additional stations from locally run networks. In addition, NCDC downloaded April Automated Surface Observation System (ASOS) data for commissioned and non-commissioned sites. This will help demonstrate what the summary will contain once ASOS commissionings are complete. Inclusion of all data will give the urban user a much more comprehensive picture of what occurred across the metropolitan area.

## ✦ Research Customer Service Group Requests

### Cotton Yields and El Niño

A researcher at an agricultural research firm obtained monthly and annual precipitation values for California from 1895 through 1997 from NCDC's web site. The researcher is looking at the impact of El Niño and cotton yields in California. The study involves looking at cotton yields in California during strong El Niño years (1978-1979, 1982-1983, and 1997-1998) and correlating the rainfall with cotton production. The premise is that in a strong to moderate El Niño year, cotton production is down due to excessive rainfall.

### Researcher Studies "Bow Echoes" and "Derechos" Using NCDC Radar Data

A University of Oklahoma researcher working under a National Weather Service (NWS)/National Severe Storm Laboratory (NSSL) sponsorship is

studying “bow echoes” using National Climatic Data Center (NCDC) archived radar data. The data was collected from various NWS sites across the Midwest and nearby states during the 1989-1992 period. The researcher is using the archived radar data to determine whether “bow echoes” actually occurred as suggested by the national radar summaries. On radar, squall lines and multi-cell storms occasionally develop the appearance of a "bow echo." The bow shape opens toward the strong mid-level winds (10 to 20 thousand foot level winds of 40 knots or greater), and there is an excellent chance that these strong mid-level currents have been transported to the ground in a down burst, forcing a portion of the squall line to accelerate forward. Macro burst and micro burst winds are common with these storms, (also called derecho’s - Spanish for straight ahead), with 100+ mph winds being reported in extreme cases.

## ✦ Satellite Data Requests

### NOAA’s ATDD Supplied Data for Savannah River Project

Kevin Birdwell of the Atmospheric Turbulence and Diffusion Division (ATDD) of NOAA’s Environmental Research Labs at Oak Ridge, TN, requested satellite data, along with upper air and surface maps, for a project summarizing weather conditions at the Department of Energy’s Savannah River site in South Carolina during April 23-25, 1991. For this project, Kevin was supplied high-resolution Geostationary Operational Environmental Satellite (GOES) -7, three-hourly visible, infrared, and water vapor images of the Augusta, GA, area along with three-hourly North American Surface charts and 850-,
700-, 500-, and 300-mb North American upper air charts for the three-day period.

### NEXRAD and GOES Satellite Data Supplied for Severe Weather Studies

The National Climatic Data Center (NCDC) is supplying GOES-8 satellite and Next Generation Weather Radar (NEXRAD) Level II data to the Regional and Mesoscale Meteorology team office of the Cooperative Institute for Research in the Atmosphere (CIRA) at Colorado State University. The data will be used to study severe weather outbreaks which occurred this year. GOES-8 satellite data from March 20, 1998, will be used to study a tornado which struck without warning near Gainesville, GA, killing 12. NEXRAD WSR88D Level II data for five National Weather Service (NWS) and military radar sites in the southeast U.S. from April 8-9, 1998, will be used in their study of the April 8 F5 tornado which struck the Birmingham, AL, suburbs killing 32, the most in a single F5 tornado since 34 were killed in the Xenia, OH, tornado of April 3, 1974. Later, the same thunderstorm complex which caused the Birmingham tornado moved over the northern suburbs of Atlanta, producing a series of F1 and F2 tornadoes which killed one and caused more than $100 million in damages.

## ✦ Requests from News Media

### Smoke From Mexican Fires

The National Climatic Data Center's (NCDC) Satellite Services Group was contacted by ABC News regarding acquisition of a series of Geostationary Operational Environmental Satellite (GOES) satellite images centered over the central Gulf of Mexico. Hundreds of fires in Mexico, which have been burning out of control due to unseasonably dry weather this spring, have contributed to massive amounts of smoke particulate matter. The series of daily visible images from May 6 through May 20 distinctly shows a large area of smoke over much of the Gulf of Mexico, extending at times well into the central U.S. These images can be viewed at NCDC’s Web site under “Satellite Resources.”

## ✦ Technology Applications

### Help Desk

The web-based automated Help Desk, developed

by NCDC's John Fauerbach, has been installed at the National Oceanographic Data Center (NODC). NODC implemented the software and found it to be very useful in enabling support staff to track trouble reports and post solutions for end users.

## ✦ Regional Climate Centers

### RCC User Contacts

The Regional Climate Centers report that direct user contacts in May totaled 2,918 resulting in over 1,100 orders. Requests serviced by their on-line systems numbered 9,423, while "hits" on their Web pages totaled over 1.3 million.

### New Climate Product Developed

A new Web-based product to provide climatological probabilities of precipitation thresholds for a particular duration (both user-selectable) for 1,800 historical cooperative stations in the western U.S. was developed by the Western Regional Climate Centers (WRCC) in response to a need expressed by Region 4 of the U.S. Forest Service. This was developed in about a week so that it could be demonstrated at a meeting of fire behavior specialists. They expressed great pleasure in the easy and rapid access to a crucial type of information essential for planning prescribed fire activities and reducing the chance of accidental escape as an uncontrolled burn. This product has applications throughout the region, and serves many other needs associated with routine WRCC activities. The precipitation probability summaries are available for each site at: http://www.wrcc.dri.edu/climsum.html.

### State Climatologist Interactions

The Western Regional Climate Center (WRCC) is working with the state of Montana to reestablish some degree of capability for a state climate function, which would rely heavily on WRCC for rapid access to historical information and displays. This has been partly fueled by concerns about developing dry (sometimes drought) conditions in eastern parts of the state. There is significant need to make more cooperative data available faster to agricultural interests.

Visits by Mike Helfert, Southeastern Regional Climate Center (SERCC) Director, to State Climate Offices (SCO) of North Carolina, Virginia, Alabama, and Georgia were undertaken. The purpose of the visits was to meet personnel, evaluate SCO resources and needs, identify various data records, data streams, and metadata from National Weather Service Coops in each state as well as from various state, university, private sector, and non-NOAA Federal agency weather stations, and to establish instruments of cooperation where desired. Similar future visits to the SCO's of Florida and Puerto Rico are pending.

### Satellite Outage Results in Loss of Data

The Southeastern Regional Climate Center (SERCC) experienced a data flow interruption crisis in May due to the loss of the Galaxy IV satellite. Staff re-oriented the Alden dish antenna to the old SBS-6 satellite. Some near real-time data were recovered; some May 19-21 data are missing.

### Western Water Talked About

Kelly Redmond, of the Western Regional Climate Center (WRCC), attended the Annual Science Meeting of the California Campus/Laboratory Collaboration Program, "Modeling and Prediction of Water Resources in California and the Western United States," held at Los Alamos National Lab in New Mexico. Several important western water issues are addressed by this unique project, which features linkages across scales, in a global/regional/watershed/local hierarchical form. Kelly gave a presentation on long-term (decades to centuries) water and climate issues in the South-west, in which the need for accurate, lengthy, and spatially dense records was stressed. There is strong demand from this and similar research programs for real-time climate information, which WRCC is developing capability to provide.

# SCIENTIFIC AND PROFESSIONAL ACTIVITIES

## ✦ Working Groups/ Committees/Meetings

### COMPS

Customer Order Management Processing System (COMPS) team members, SAO personnel, and Marada personnel will travel to Virginia Beach, VA, the week of June 8 to perform formal qualification testing. COMPS (Build 2.0) will be installed the week of June 15. Some of the major features of this upgraded software include: acceptance of American Express and Discover credit cards; receipt of money in Asheville for orders received at NODC; entry of custom products, in addition to standard products; automatic scheduling of nighttime batch jobs; remote printing; ability to add standard reports written by government personnel; and automatic notification for specific COMPS processes.

### GOES Data Request

Doug Ross, of the National Climatic Data Center (NCDC), met with National Reconnaissance Office (NRO) and Space Science and Engineering Center (SSEC) representatives on May 7 in Madison, WI. Discussions were held regarding the processing logistics of the large Geostationary Operational Environmental Satellite (GOES) data request for the NRO. It was decided that all GOES-8 and 9 continental U.S. sectors would be processed at 4km resolution for all channels for the period January 1997 to December 1998. NCDC will be responsible for processing the data from October 1997 to December 1998. GOES-8 and 9 data will be provided on separate 3590 tapes for each month of data. SSEC has agreed to write software to allow the National Climatic Data Center to more easily process these data.

### MitreTek Workflow Management Meeting

Curt Benner, of the National Climatic Data Center, met with MitreTek personnel on May 15 in Suitland, MD, to discuss and clarify the workflow management diagrams that MitreTek developed last year. A new area being considered for inclusion in the order fulfillment workflow diagram is the processing of orders for satellite images in hardcopy and digital formats. Also discussed was implementation of the new archive system (Archive b) and the effects archiving data on 3590s in the 3494 Tape Library Dataserver may have on the workflow diagrams. Additionally, MitreTek expressed their willingness to supply a Windows NT workstation and Exchange Server to conduct a live “proof of concept” test of the Eastman workflow product demonstrated earlier. The testing would be exercised in parallel with the current processes for filling customer orders.

### Insurance Seminar

Mike Changery, of National Climatic Data Center (NCDC), attended the Applied Insurance Research (AIR) Seminar on Managing Catastrophe Risk May 19-22 in Colorado Springs, CO, as an invited speaker. He led discussions on current and anticipated changes in tropical and extra tropical system intensities, frequencies, and areas of occurrence as a consequence of a warming world. The seminar was attended by over 130 insurance representatives from the U.S. and other countries. Clients use AIR modeled results to analyze risk exposure and to optimize their portfolios. Mr Changery will provide AIR with samples of additional data available from NCDC to better model regional and local impacts on insurance risk by severe wind episodes.

## ✦ Visitors

### NC State Climatologist Office Personnel Visit NCDC

Three researchers from the North Carolina State Climatologist's Office visited the National Climatic Data Center (NCDC) on May 21, 1998. The scientists met with various NCDC personnel and obtained hourly surface meteorological observations for the last thirty years as input to various research projects. They were also briefed on various inventory systems, databases, and reports and publications available via the NCDC Web page. They were impressed by NCDC's on-line climatological data resources, including our El Niño information.

### New Educational Children's Book

Freelance writer Ms. Patricia Barnes-Svarney visited the National Climatic Data Center (NCDC) on May 12 to preview hundreds of Geostationary Operational Environmental Satellite (GOES) and Polar-orbiting Observational Environmental Satellite (POES) satellite images. The most interesting ones will be selected for a new book she is working on called "Strange Skies." Some of the satellite images will include the Mount St. Helens eruption of May 18, 1980, the "Perfect Storm" on October 31, 1991, and powerful Hurricane Linda on September 12, 1997. Ms. Barnes-Svarney has authored more than 16 books, and contributed articles to "Popular Science" magazine.

## ✦ Publications

### Satellite Assessment of Urban Heat Islands

A paper titled "Assessment of Urban Heat Islands: A Multi-Sensor Perspective for the Dallas-Ft. Worth, U.S.A. Region" by K. Gallo (NOAA/ORA) and T. Owen (NOAA/NCDC) has been accepted for publication by the journal "Geocarto International." The paper was one of several invited for a future issue of the journal that will include papers presented in the Remote Sensing sessions of the annual meetings of the Association of American Geographers. The paper presents a methodology for identification of climate observation stations that could be considered "urban" through the integrated use of NOAA-AVHRR, Landsat-Multi spectral Scanner, and Defense Meteorological Satellite Program-Operational Linescan System data.

### Paper Accepted for Publication

The "International Journal of Climatology" has accepted a comprehensive review paper on homogeneity adjustments of in situ atmospheric climate data written by the National Climatic Data Center's (NCDC) Tom Peterson and 20 co-authors (3 of which are from NCDC) from 11 countries: Peterson, T. C., D. R. Easterling, T. R. Karl, P. Ya. Groisman, N. Nicholls, N. Plummer, S. Torok, I. Auer, R. Boehm, D. Gullett, L. Vincent, R. Heino, H. Tuomenvirta, O. Mestre, T. Szentimre, J. Salinger, E. Førland, I. Hanssen-Bauer, H. Alexandersson, P. Jones, and D. Parker, 1998: "Homogeneity Adjustments of In Situ Atmospheric Climate Data: A Review." "International Journal of Climatology," in press.

## ✦ Interactions with NOAA Line Offices

### NWS Workbook

With the assistance of the National Climatic Data Center's (NCDC) Satellite Services Group, the National Weather Service Forecast Office at Raleigh, NC, is developing a workbook for the meteorologists on station. This workbook consists of satellite images of recent weather events that have affected the Raleigh forecast area. It contains two winter storms, a fire, two hurricanes, and two severe weather events. Still needed are tropical storms and additional severe weather events. By viewing the imagery, the meteorologists hope to become familiar with the various event signatures.

# EMPLOYEE ACTIVITIES

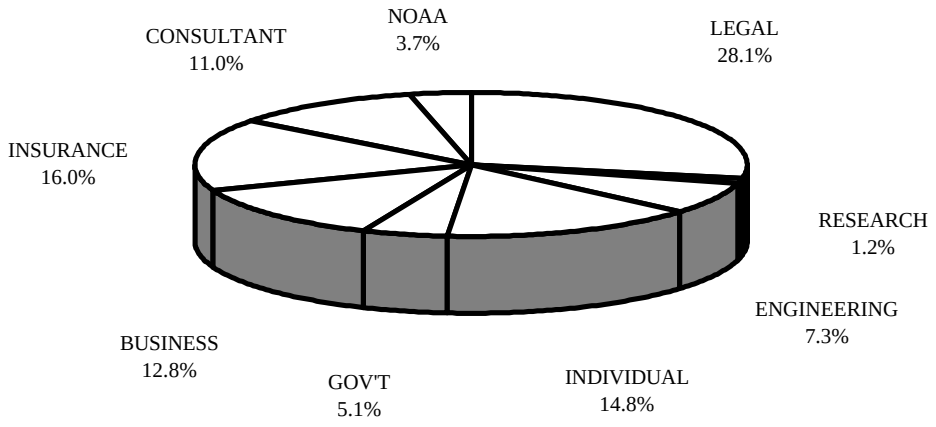
## ✦ EEO and Community Outreach

### NCDC Meteorologist Invited As Career Day Speaker

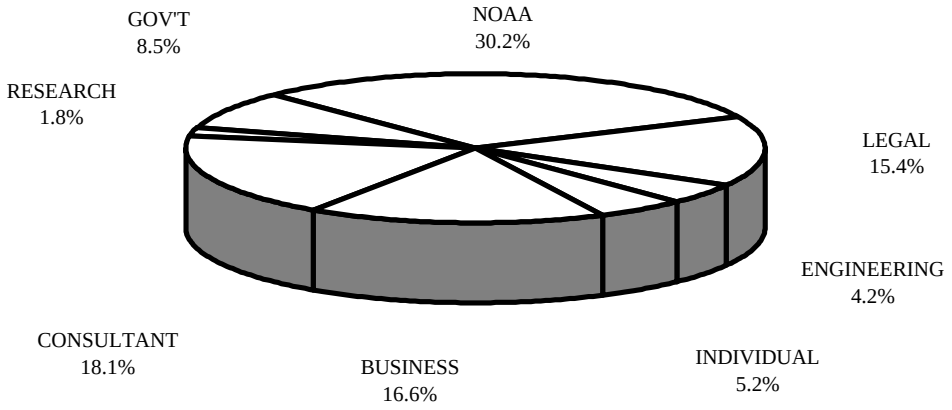
Tom Ross, of the National Climatic Data Center (NCDC), was an invited speaker at Asheville's Randolph Elementary School's Career Fair on May 27, 1998. Mr. Ross gave ten, fifteen-minute presentations which focused on career opportunities available in the field of meteorology. The presentations allowed several hundred students to hear about career opportunities and about training and skills needed for a career in meteorology. Mr. Ross also focused on forecasting opportunities, climatology, El Niño, and the functions of NCDC.

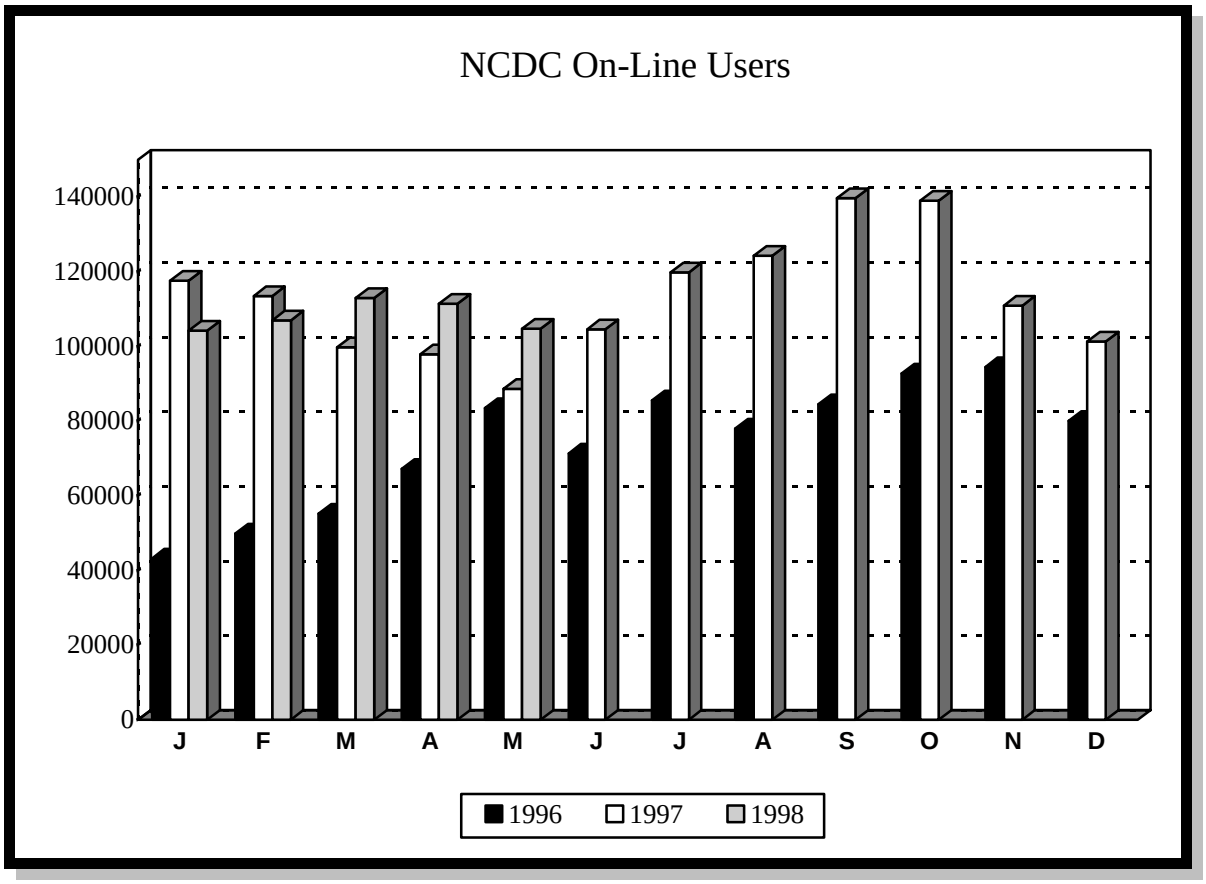
The following charts and graphs show the latest National Climatic Data Center user and data statistics.

## Customer Profile Based on Orders




## Customer Profile Based on Order Cost




NCDC On-Line Users
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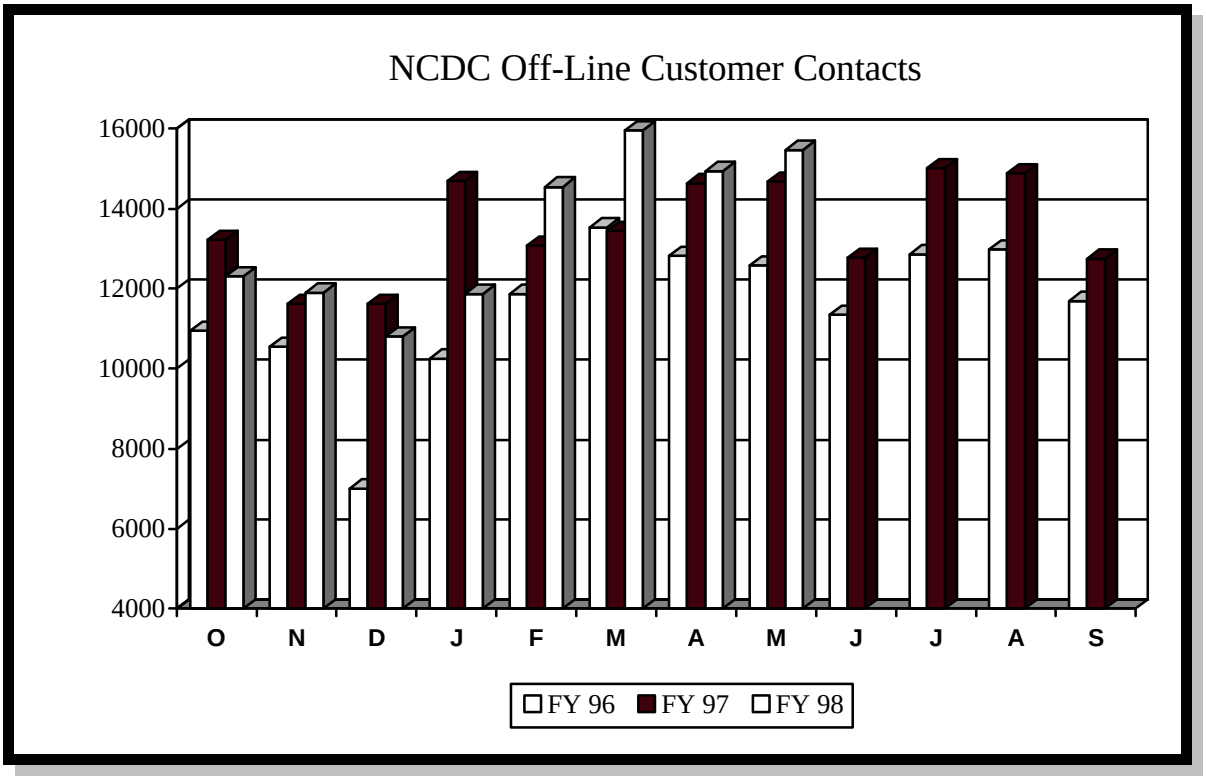
120000
100000
80000
60000
40000
20000
0
J F M A M J J A S O N D
1996 1997 1998


NCDC Off-Line Customer Contacts
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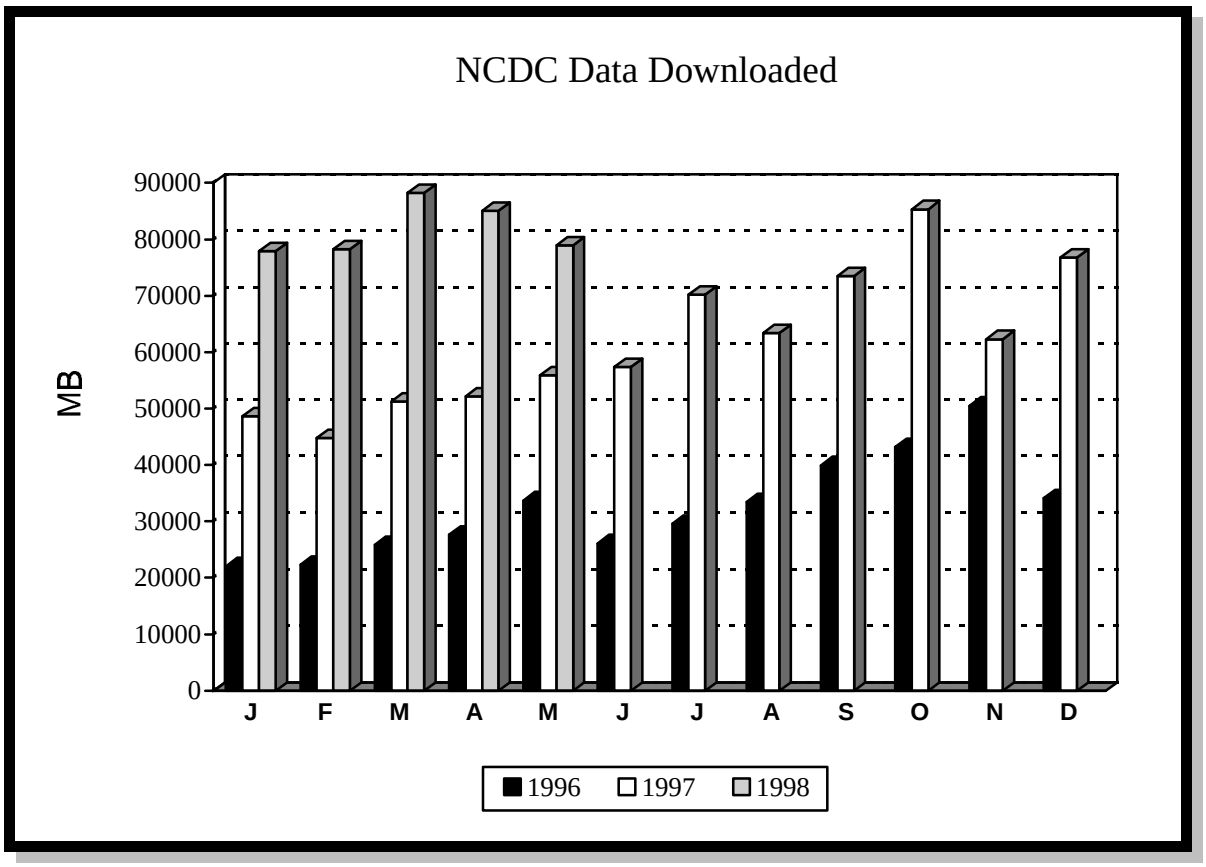
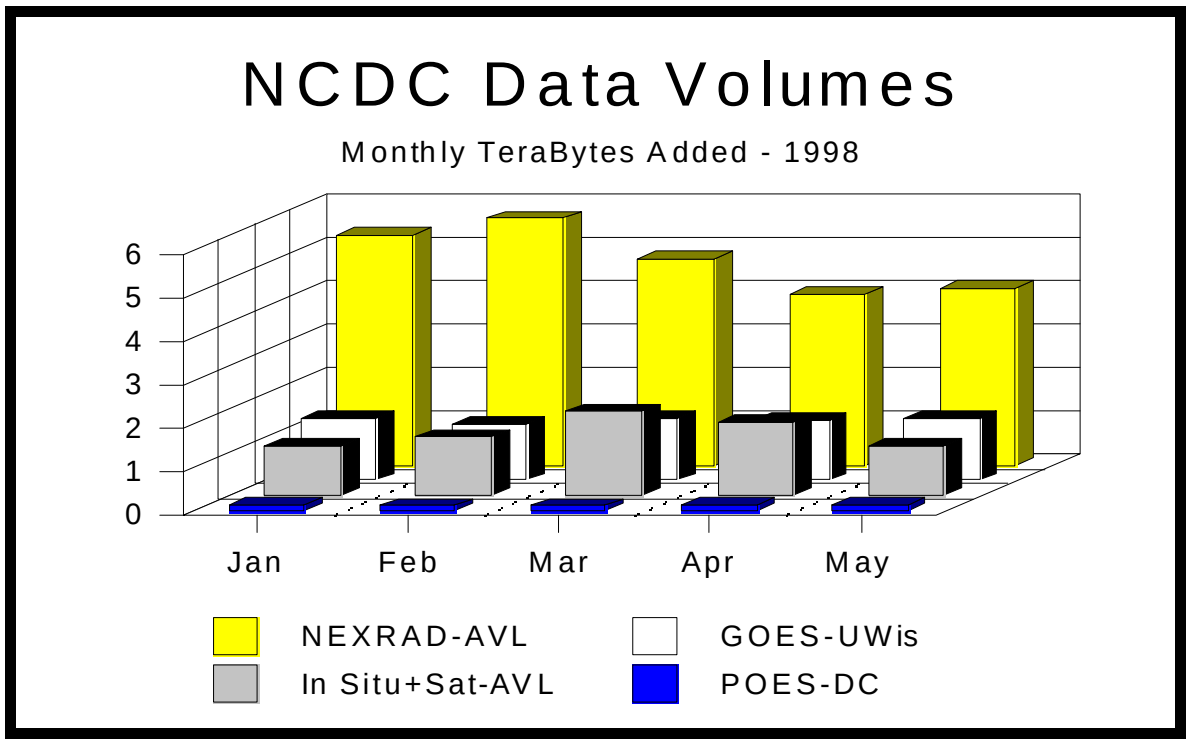
14000
12000
10000
8000
6000
4000
O N D J F M A M J J A S
FY 96 FY 97 FY 98


NCDC Data Downloaded
MB
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
J F M A M J J A S O N D
1996 1997 1998


NCDC Data Volumes
Monthly TeraBytes Added - 1998
6
5
4
3
2
1
0
Jan Feb Mar Apr May
NEXRAD-AVL
In Situ+Sat-AVL
GOES-UWis
POES-DC